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HOMOGENIZED DUMP COAL IN REK BITOLA

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ABSTRACT
In reflection of the continually changing conditions and demands of the market with fuel, dynamic adaptation is an imperative toward modern trends in the process of exploitation of coal in mines and their further storage. One possible way is a selective exploitation of the mine and further homogenization of the coal mixtures like layers. The homogenization of fuel (coal) in this case, the quality regularization of average physical-chemical characteristics of the exploited coal are implied.
Major theme of the paper is the useful and necessary machinery and the method of storage of coal, which will serve the possible homogenization of exploited coal-fuel in the mines Suvodol and Brod Gneotino. Those objects will enable measuring the contents of ash, the quantity of transported coal and caloric value of the coal, which will be used in the given location and is distributed in the thermal-electrical plant "Bitola" dump. Part of this is the transfer of measured values from individually measured places in the mines Suvodol, Brod Gneotino, and the dump of fuel in power plant Bitola in the dispatch center, their concentration and visualization of the information system.
Key words: *homogenization, coal, power plant, storage, exploitation*

1.0. Introduction

The global changes of the conditions and demands of the fuel market, necessary require dynamic adaptation toward the contemporary technical technological trends of the process for coal exploitation in the mines and also its storage in other words depositing in the dump coals. The primary homogenization of the coal (selective excavation and homogenization of the coal quality during the excavation itself with the excavator units) and secondary homogenization during depositing in the coal dump, with important factor in the saving of this fossil un-renewable fuel, in the era of high price of the fuels and the energy of them.

2.0. SUBJECT OF THE PROGRAM FOR MONITORING AND HOMOGENIZATION OF THE COAL IN THE REK BITOLA MINES

Subject of the program for monitoring and homogenization of the coals of REK Bitola mines, (in the first phase only for the mine "Suvodol", and in the second phase also the coal from "Brod-Gneotino") is placing of analysts for monitoring of the quantitative - qualitative parameters of the coal of the other working units in the mines and at the dump coal itself in front of the power plants, and all with aim of reaching homogenized coal with quality anticipated by the projects of the thermal power plants. (fig.1) The whole homogenization process (primary and secondary), will be monitored and regulated by software through the main dispatcher center.

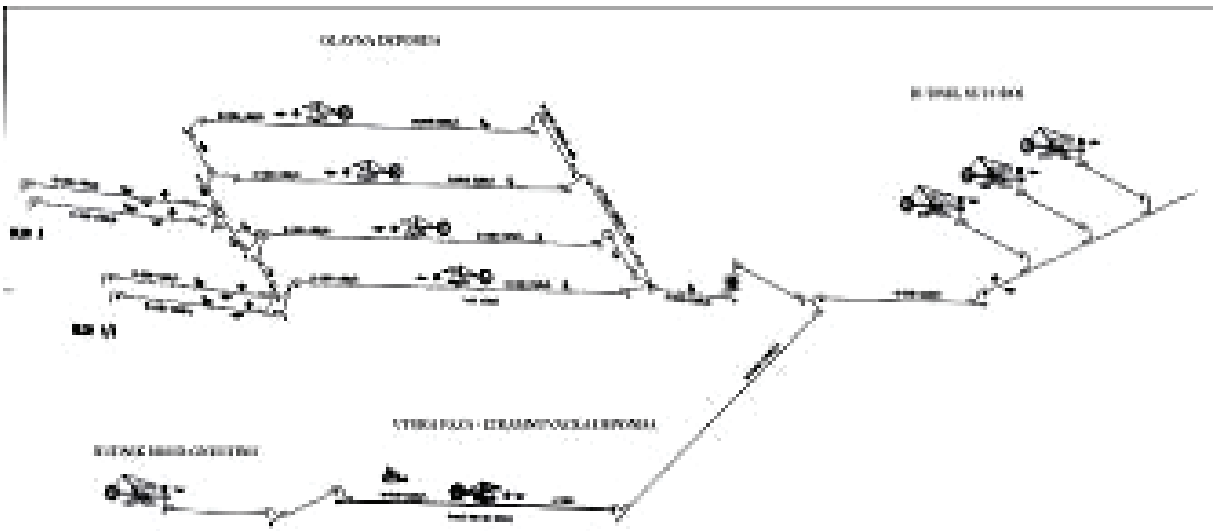

Fig. 1

3.0 PRESENT SITUATION

The excavation of the coal is done of the main coal seam in the mine "Suvodol" with three excavator units (two excavator units SRs-630 and one KU-300), with annual capacity of 6.000.000 (t^3) (fig.1). The excavator units are equipped only with weighers with which a quantitative control by excavators is made. Weight flow meter with qualitative analyst is performed on the haulage conveyor in front of the dump coal entrance in the thermal power plants.

Four excavator units at the dump coal (combined – for depositing and excavation of coal) are without instruments – weighers for measuring the excavated coal. That means the coal that is transported to the bins in the TPP is not measured neither quantitatively nor qualitatively.

This way does not give possibility about quantity and quality control of the coal that is burned in the TE. The coal quantities and the heating capacity consumed in the thermal power plants are established reversible. That means they are established on the basis of the produced el. Energy and the average heating capacity of the excavated coal.

4.0. TECHNICAL SOLUTION ABOUT COAL QUALITY AND QUANTITY CONTROL AND ITS HOMOGENIZATION

The system for coal quality and quantity control that is planned to be used, will have an aim to optimize the process of primary homogenization (homogenization during the coal excavation itself out of the working blocks with the excavating units) and secondary homogenization (depositing and excavation of the coal out of the coal dump in the thermal power plant). The qualitative and quantitative parameters will be monitored through the commanding dispatcher center from where the analyses will be performed and will be reacted about the coal quality. (Fig. 2)

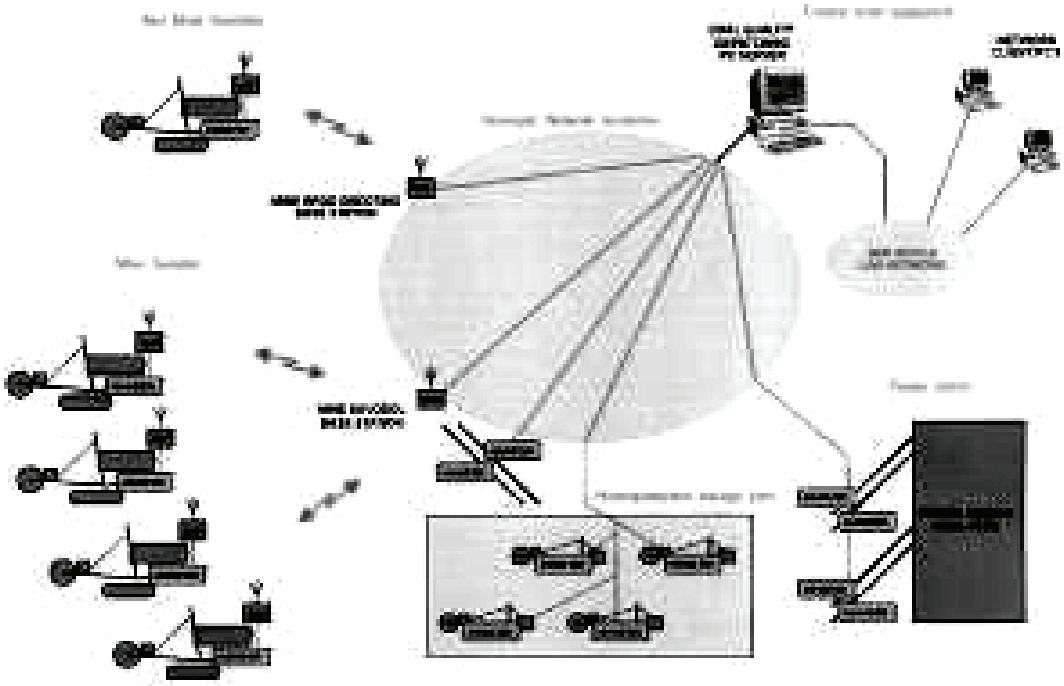

Fig. 2

4.1. Primary homogenization

The primary homogenization will be made on the very place of the coal excavation with dredging units on the excavation sites in the mine. Each of the three excavators shall be equipped with balance for monitoring the weight flow and analyst of heating capacity of the excavated coal (Fig. 3). This type of analyses shall be performed with apparatus that uses radioactive bodies whose limits of safety zones are not surpassing the conveyor sizes, and the height of radioactive radiation is in the scope of all international limits of maximal allowed height of radioactivity for such type of apparatus.

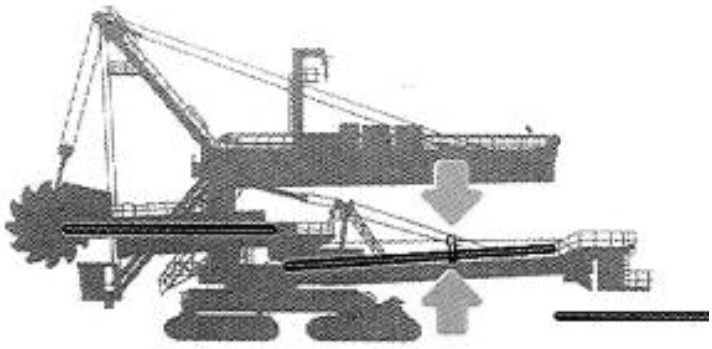

Fig. 3

The data for measured parameters are transferred with wireless connection to the dispatcher center, from where the regime of work of each dredger unit separately is established, in dependence with the heating capacity of the coal of each excavation site separately.

4.2. Secondary homogenization

The secondary homogenization in the first phase (until the start of operation of the new mines "Brod-Gneotino" and "Floor series") shall be performed with homogenization of the coal during depositing in the existing coal dump in front of the thermal power plants. In the coal dump the coal shall be deposited in accordance to the quality by established regime for homogenization with aim to get the values most close to the necessary minimal heating capacity for the thermal power plants. Final homogenization of the coal shall be performed during the excavation itself with combined dredgers that service the coal dump.

The technology of depositing the coal could be with method of depositing with movement (windrow) and subsequent cross sectional excavation, and all this operationally guided from the commanding dispatcher center.

4.3. Homogenization system characteristics

The qualitative parameters will be measured with apparatus for measurement GE 3000, which at the same time gives data about excavated coal quality and quantity. This apparatus uses the axial radioactive bodies which radiate, during which the limits of the safety zones did not exceed the dimensions of the conveyor belts. The apparatus shall be installed on the discharging conveyors of the excavation units.

The data transfer of the measuring places shall be done with support of optical lines (Ethernet) as well as over wireless way (WHF/UHF), (Fig.4). The system comprises complete software solution about homogenization by Windrow method.

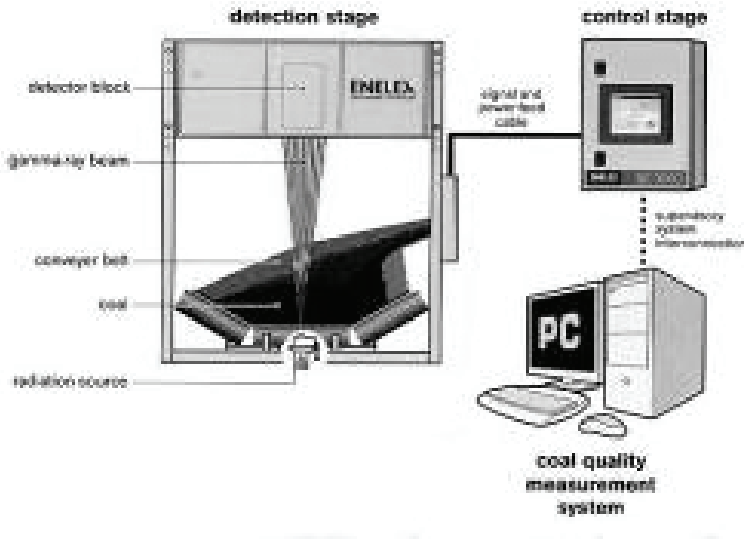

Fig. 4

4.4. System for assessment and visual review and serving

Measured information of the technological process of getting shall be transferred in the central server of the system for regulation of quality in the data base. From here they will be processed through processing block and here they will be archived for further use in a one minute cycle.

The program block processing of data through on-line connection take over measured data and information about the technology condition of the conveyed coal, basic excavation units and combined dump coal dredgers.

The program block visualization of the actual condition of the depositing technology, as a user program has a possibility for inclusion of free number of PC, during which the information shall be reviewed in a form of present schemes about the condition of the depositing technology, tables and other interactive forms.

Ideographic script of the operational panel in the cabin of the excavation units shall be in alphanumeric display.

5.0 CONCLUSION

The necessity of savings of the energetic resources and the price that they reach at the market, lead to necessity of consideration in REK Bitola, of consideration about different treatment of the basic energetic fuel for the thermal power plants. The previous only quantitative treatment of the coal lead to situation to consume quantitatively more coal without taking into consideration about its heating capacity. That means that it is consumed coal with bigger heating capacity than that which is with project anticipated for the needs of the thermal power plants, during that not to be diluted with less quality, with which will attain exploitation of the coals from the mine with lower caloric value and with that also greater degree of reserves exploitation.

6.0 LITERATURE

[1] Study about homogenization of the coal in REK Bitola (2009), Bitola